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Long waiting lists in hospitals

Operational research needs to be used more often and may provide answers

Long waiting lists have become symbols of the inefficiency of hospital services all over the world, particularly in publicly funded hospitals.¹ After decades of attempts, we still do not know what it would take to solve the problem. The dynamics of waiting lists are not well understood.² Also, the potential productive capacity of the hospitals is hard to estimate, as hospital production is very complex. We believe that most hospitals operate close to their capacity limits, given the way they are organised and given the present methods of coordination and control. We do not know if these methods are the best, or if significant improvements could be achieved by employing other methods.

One way to alleviate the burden for patients waiting weeks or months for admission would be to give them the date of admission right away. A firm date would be of great practical value and probably make long waits less stressful. This requires a booked admission system. An operational research study of such a booked admission system for cardiac surgery is published in this issue (p 280).³ Based on a mathematical model and routinely collected data on more than 7000 patients treated with cardiac surgery in a London hospital, the authors investigate the impact of a simple, hypothetical booking system on the requirement for intensive care beds after surgery. The study shows that due to substantial variations in length of stay, booking is likely to produce frequent operational problems. To avoid cancellations and keep the chances of operational overload to 5% or less, a reserve intensive care bed capacity of more than 30% would be needed. This is possible, but expensive. The authors conclude that even if booked admission systems might work well in some areas, for instance day case surgery, serious operational problems might occur in other areas, in particular if the hospital is operating close to its capacity limits.

The study is well designed, and the conclusions seem to be well founded. The study also shows that operational research is well suited to deal with operational problems in hospitals. It is tempting, however, to go beyond the scope of the study and ask: What is the amount of reserve capacity in the hospital today, not only in terms of intensive care beds, but also in terms of operating teams and theatres? Obviously, if the length of stay cannot be predicted before admission, the only way to reduce the need for reserve intensive care beds would be to adjust the number of operations per day according to the number of

occupied postoperative beds. This would require reserve capacity in terms of operating teams and theatres. Therefore, a considerable amount of reserve capacity is needed, even if admissions are not booked. How much would booking worsen the situation? Is it possible to reduce the additional need for reserve capacity, for instance by sharing reserve capacity with other specialties? To answer this, another operational research study would be needed.

Operational research is concerned with the conduct and coordination of activities within complex systems, using tools like mathematical modelling, queuing theory, and simulation to study the consequences of alternative courses of action and to optimise performance of the system. Starting with military and industrial applications during and shortly after the second world war, it soon spread to other areas, including hospitals and health services. The European working group on operational research applied to health services was established in 1975.⁴

Many hospital applications deal, one way or another, with problems related to the uncertainty and variability in demand for resources and services. A typical application is reported from an outpatient clinic that suffered from a high degree of congestion, with patients often waiting over half an hour, and sometimes much longer, for consultations that lasted a few minutes.⁵ The investigators used a simple queuing model to analyse the situation, and suggested a revised appointment system. As is often the case, the challenge was not only to devise an improved solution, but also to convince the people concerned that this solution would work. However, by using simple and instructive graphical presentations, the investigators were able to convince hospital managers and medical staff that substantial reductions of patient waiting time would be possible without significantly increasing doctors' idle time. The new system was adopted with great success, and similar solutions were later applied to other clinics in the hospital.

Other applications include scheduling admissions,⁶ evaluation of priority strategies,⁷ allocation of operating theatres,⁸ capacity planning for intensive care units,⁹ bed capacity analysis and planning,¹⁰ and blood bank management.¹¹ In these and other areas, operational research can provide not only numerical answers to problems, but also insights into the nature of the problem, thereby helping hospital staff and

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managers to ask the right questions, make sense of the answers, and look in the right direction for solutions.

Compared with many other organisations, hospitals have been slow in adopting operational research as a means to improve their performance. Applications are scattered and the results not always used, even if they are relevant and reliable. The implication is that, so far, hospitals have largely failed to use one of the most potent methods currently available for improving the performance of complex organisations.

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Preventing domestic violence

Most women welcome inquiries, but doctors and nurses rarely ask about it

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Domestic violence can be physical, sexual, or psychological. Physical and sexual violence by an intimate partner are common problems, affecting 20-50% of women at some stage in life in most populations surveyed globally.¹ Between 3% and 50% of women have experienced it in the past year.¹ Domestic violence has a profound impact on the physical and mental health of those who experience it. As well as injuries, it is associated with an increased risk of a range of physical and mental health problems and is an important cause of mortality from injuries and suicide.²

Review of international literature on risk of domestic violence shows that although it is greatest in relationships and communities where the use of violence in many situations is normative, notably when witnessed in childhood, it is substantially a product of gender inequality and the lesser status of women compared with men in society.³ Except for poverty, few social and demographic characteristics define risk groups. Poverty increases vulnerability through increasing relationship conflict, reducing women's economic and educational power, and reducing the ability of men to live in a manner that they regard as successful. Violence is used frequently to resolve a crisis of male identity. Domestic violence is often associated with heavy alcohol drinking.³ Research suggests that the different factors have an additive effect.

Although interventions that alter the prevalence of any of these risk factors may alter the prevalence of domestic violence, few programmes that seek primarily to reduce, for example, poverty or consumption of alcohol evaluate the impact on the prevalence of domestic violence. A notable exception was the Grameen Bank project in Bangladesh, where ethnographic evaluation suggested that women participating in the microcredit programme were protected to some extent against domestic violence by having a more public social role.⁴

Evidence suggests that domestic violence can be prevented in populations in developing countries that have not been specifically identified as affected through life skills type programmes that address gender issues and include relationship skills. A review of qualitative evaluations and experiences using the *Stepping Stones*,⁵ a training package to promote sexual and reproductive health in various communities in Africa and Asia, found a reduction in conflict and violence in sexual relationships to be a major impact in all communities studied.⁶

Most interventions on domestic violence focus on women and men who have been identified as abused or abusing. Evaluation of initiatives has been sorely lacking. The only review of programmes to prevent domestic violence found 34 projects that had been evaluated, two thirds of which were in the criminal justice system.⁷ In many countries interventions focus on legal redress and secondary prevention through protection orders, shelters, counselling services, specialised police units and courts, and mandatory arrest laws. Although many women find these helpful, evidence of their effectiveness in preventing domestic violence is limited.⁸ Treatment programmes for abusers are similarly found in many countries but, unless compulsory, they are plagued by very high drop out rates. Again the evidence for their effectiveness is weak.⁹

The two papers in this issue confirm previous research that shows that domestic violence is a common underlying problem in clinical practice (pp 271, 274).¹⁰⁻¹¹ Bradley et al show strong associations with anxiety and depression.¹⁰ The papers also confirm research findings from the United States that show that most women welcome inquiries, but doctors and nurses rarely ask about it.¹⁰⁻¹¹ One obvious explanation for this is that they are not trained to do so and are uncertain what they can do.¹² Gender and health issues, including domestic violence, feature little in under-